

WHAT IS CLAIMED IS:

1. A flash memory access apparatus, comprising:

a flash memory with regions divided on the basis of a unit that consists of predetermined blocks; and

a flash memory controller,

wherein when a write operation is requested for a logical block number of the flash memory, the flash memory controller is configured to write data and meta-information in a physical block corresponding to a logical block with the logical block number if a previous write operation has not been performed for the logical block, and the flash memory controller is configured to perform a write operation for writing the data and the meta-information allocated to the logical block in a new physical block without changing flash memory state information written in a previous physical block corresponding to the logical block if the previous write operation has been performed for the logical block.

2. The apparatus as claimed in claim 1, wherein the meta-information is written after the data of the logical block is written.

3. The apparatus as claimed in claim 1, wherein the data and meta-information of the logical block are simultaneously written.

4. The apparatus as claimed in claim 1, wherein the meta-information includes the logical block number, and the flash memory state information indicating a state of the physical block as valid, deleted, or invalid.

5. The apparatus as claimed in claim 1, wherein the flash memory controller is configured to perform a recovery operation for detecting, during a scanning process, physical blocks for the logical block number existing according to the write operation and for recovering from an error by determining a valid block for the logical block among the detected physical blocks.

6. The apparatus as claimed in claim 5, wherein the scanning process comprises reading a logical block number for each of the physical blocks by investigating the flash memory based on a latest accessed lower block, and investigating a field of the logical block number of a block allocation table corresponding to the read logical block number.

7. The apparatus as claimed in claim 6, wherein the investigating the field of the logical block number of the block allocation table includes writing a state value of "1" in the field of the logical block number if the state value has been "0," and detecting that the logical block number has been searched for through the previous physical block during the scanning process, if the state value is "1."

8. The apparatus as claimed in claim 5, wherein the error recovery operation based on the determination on the valid block includes determining a latest accessed physical block for the logical block number among the detected physical blocks according to priorities set during the scanning process, as the valid block, and rewriting flash memory state information written in the other physical blocks as deleted.

9. The apparatus as claimed in claim 5, wherein the error recovery operation is performed during the initializing the flash memory.

10. The apparatus as claimed in claim 5, wherein the error recovery operation is performed during reclaiming the flash memory in which data written in a predetermined unit of the flash memory are moved to a new unit.

11. A flash memory access method, comprising the steps of:

accessing the flash memory and searching for a currently writable physical block if a processor requests a write operation for a specific logical block number of the flash memory;
and

writing data and meta-information in a physical block corresponding to a logical block with the logical block number if a previous write operation has not been performed for the logical block, and writing the data and the meta-information in a new physical block corresponding to the logical block without changing flash memory state information written in a previous physical block corresponding to the logical block the previous write operation has been performed for the logical block.

12. The method as claimed in claim 11, wherein the meta-information is written after the data of the logical block is written.

13. The method as claimed in claim 11, wherein the data and meta-information of the logical block are simultaneously written.

14. The method as claimed in claim 11, wherein the meta-information includes the logical block number, and the flash memory state information indicating a state of the physical block as valid, deleted, or invalid.

15. The method as claimed in claim 11, further comprising a recovery operation including detecting, during a scanning process, physical blocks for the logical block number existing according to the write operation and of recovering from an error by determining a valid block for the logical block among the detected physical blocks.

16. The method as claimed in claim 15, wherein the scanning process comprises:
reading a logical block number for each of the physical blocks by investigating the flash memory based on a latest accessed lower block, and investigating a field of the logical block number of a block allocation table corresponding to the read logical block number; and
writing a state value of "1" in the field of the logical block number if the state value has been "0," and detecting that the logical block number has been searched for through the previous physical block during the scanning process, if the state value is "1."

17. The method as claimed in claim 15, wherein the recovery operation step comprises recovering from the error by determining a latest data among data of a specific

logical block number detected during reclaiming the flash memory in which data written in a predetermined unit of the flash memory are moved to a new unit.